



NASA Science Suborbital Platforms *2023 and beyond*



Scientific
Balloon



ER-2



WB-57



GV



G-III



C-20A



DC-8

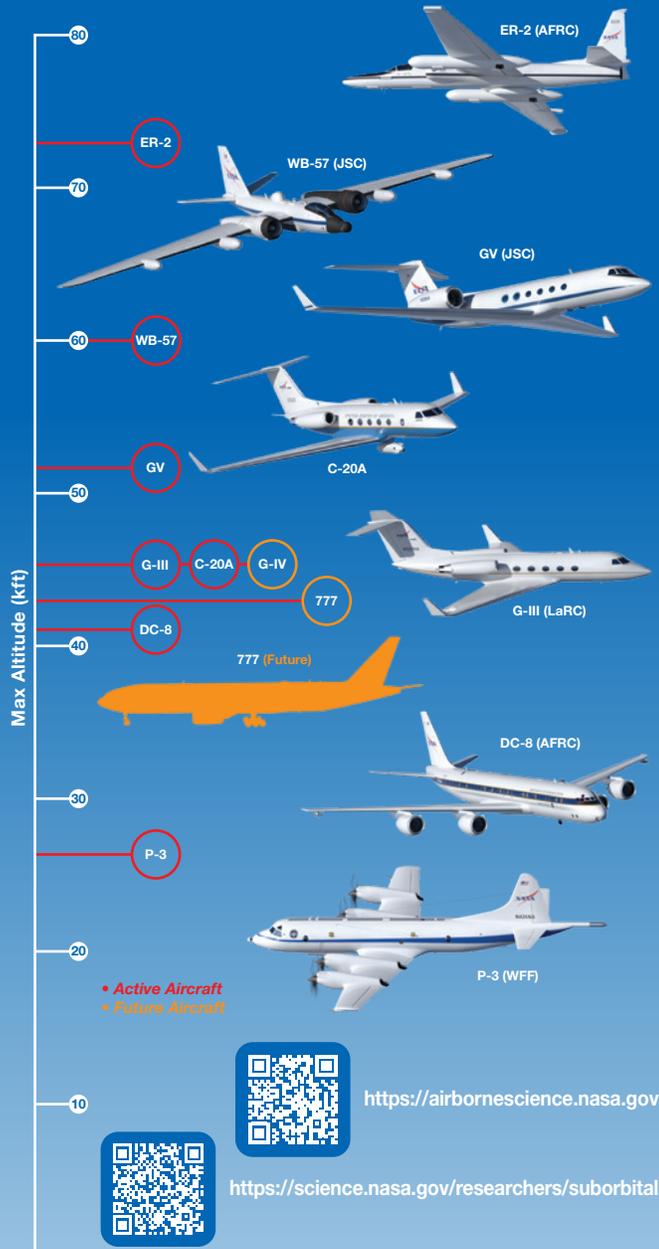


P-3

NASA Science supports a variety of suborbital platforms that are designed to take science measurements, including aircraft, balloons, kites, and uncrewed aircraft systems. The graphic depicts some of these platforms.

AIRBORNE MISSIONS 2023

(partial list)



The NASA Airborne Science Program provides a unique set of NASA supported aircraft that benefit the earth science community. These piloted and uncrewed aircraft carry the sensors that provide data to support and augment NASA spaceborne missions.

AIRCRAFT	AIRBORNE MISSION
ER-2 (AFRC)	Airborne Lighting Observatory for FEGS and TGFs Campaign (ALOFT)
	Earth Mapping Resources Initiative (EMRI)
	Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms (IMPACTS)
	Submesoscale Ocean Dynamics and Vertical Transport investigation (S-MODE)
WB-57 (JSC)	Stratospheric Aerosol Processes, Budget, and Radiative Effects (SABRE)
	Atmospheric Chemistry and Dynamics studies
GV (JSC)	Biodiversity Survey of the Cape (BioSCape)
	Surface Water and Ocean Topography - post launch cal/val (SWOT cal/val)
	Synergistic TEMPO Air Quality Science (STAQS)
C-20A (AFRC)	Multi-Band Synthetic Aperture Radar (SAR) for Multidisciplinary Science Support
	Biodiversity Survey of the Cape (BioSCape)
G-III (LaRC)	Student Airborne Research Program - East (SARP East)
	Submesoscale Ocean Dynamics and Vertical Transport investigation (S-MODE)
	Synergistic TEMPO Air Quality Science (STAQS)
DC-8 (AFRC)	Atmospheric Emissions and Reactions Observed from Megacities to Marine Areas (AEROMMA)
	Student Airborne Research Program (SARP)
P-3 (WFF)	Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms (IMPACTS)
777 (Future)	Atmospheric Observing System (AOS) support; Oceanic, Cryospheric, and Weather Science Campaigns
G-IV (Future)	AirSAR-2 Multi-band Synthetic Aperture Radar (SAR), NISAR Support and Multidisciplinary Science.

UNCREWED AIRCRAFT SYSTEMS (UAS)

ALTA X (AFRC, ARC, LaRC)

Black Swift S2 (ARC, LaRC)



SIERRA-B (ARC)



Global Hawk (AFRC)

HALE UAS Prototypes Under Development

Swift Ultra Long Endurance

Electra

SCIENTIFIC BALLOONS

A balloon serves as a carrier for science instruments in a similar manner as an orbiting satellite or the Space Shuttle would, but at much lower costs. Scientific balloons are very large structure typically made of a thin, 0.02 mm (0.8 mil) thick, polyethylene film, about the same thickness as an ordinary sandwich wrap.



Zero-Pressure Balloons

These balloons are open at the bottom and have open ducts hanging from the sides to prevent the pressure inside the balloon from building up during gas expansion as the balloon rises above Earth's surface.



Super-Pressure Balloons

These ultra-long duration balloons, or ULDBs, are completely sealed with no open ducts and the gas will not escape the balloon. As the balloon rises and the gas expands, the pressure increases inside the balloon until it stabilizes at the flotation altitude.

KITES

The NASA Advancing Earth Research Observations with Kites and Airborne Sensors (AEROKATS) program kites are designed to carry small remote sensing instruments.



Parafoil

Custom, light-weight parafoil kite designed to carry small (1-2 lbs) remote sensing instruments typically flown at or below 500 ft above ground level (AGL).



Delta Conyne

Designed to carry instruments up to 1 pound flown at or below 500 ft above ground level (AGL).



Delta

Custom light-weight Delta kite designed to carry instruments up to 1 pound flown at or below 500 ft above ground level (AGL) in very light winds